

Climate Change: The Public Health Response

North Carolina Climate Change Adaptation Workshop
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Centers for Disease Control and Prevention

Potential Health Effects of Climate Change

Climate change:

- Temperature rise
- Sea level rise
- Hydrologic extremes



VECTOR-BORNE DISEASES

WATER-BORNE DISEASES

WATER AND FOOD SUPPLY

MENTAL HEALTH

ENVIRONMENTAL
REFUGEES



Heat stress, cardiovascular failure



Injuries, fatalities



Asthma, cardiovascular disease



Resp allergies, poison ivy



Malaria, dengue, hantavirus, encephalitis, Rift Valley fever



Cholera, cryptosporidiosis, campylobacter, leptospirosis



Malnutrition, diarrhea, harmful algal blooms



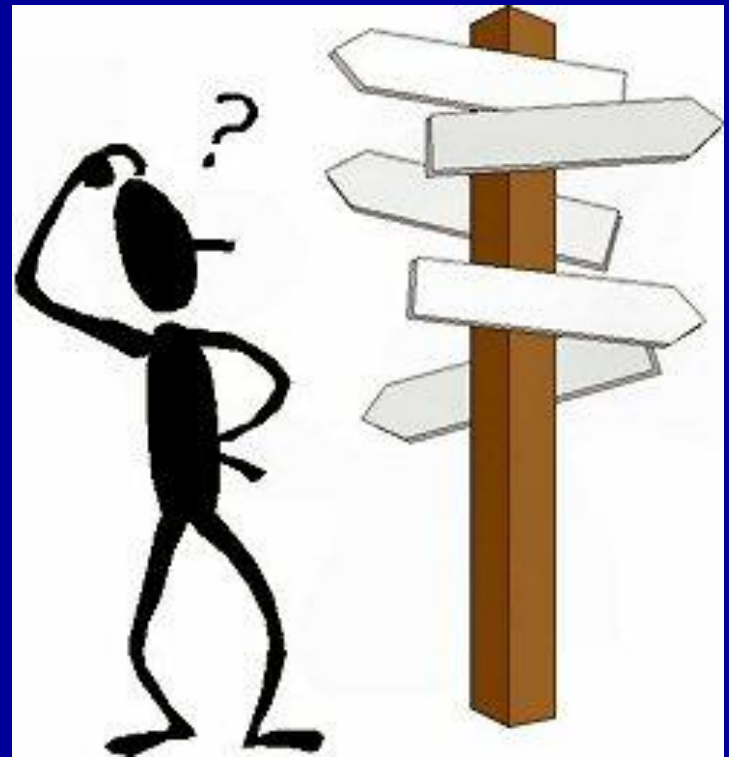
Anxiety, post-traumatic stress, depression, despair



Forced migration, civil conflict

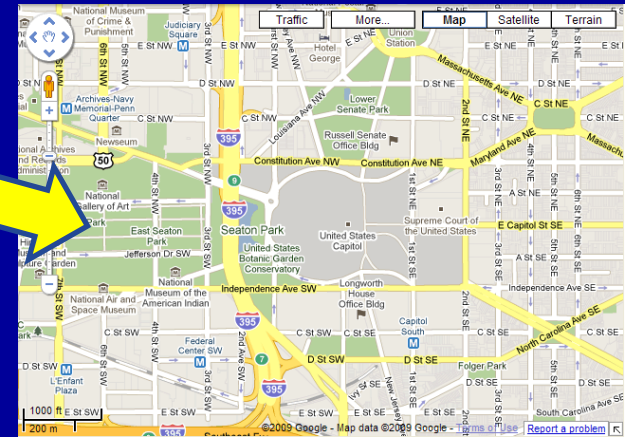
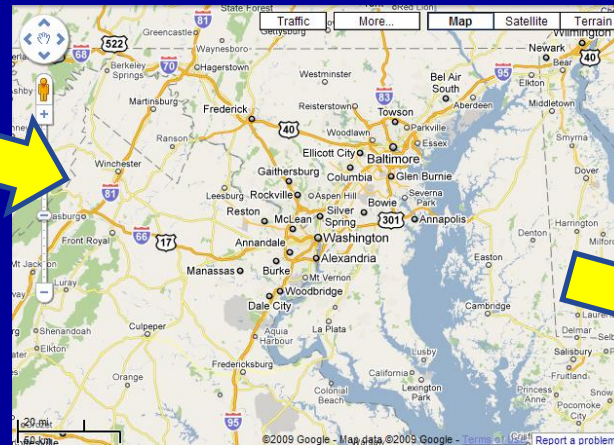
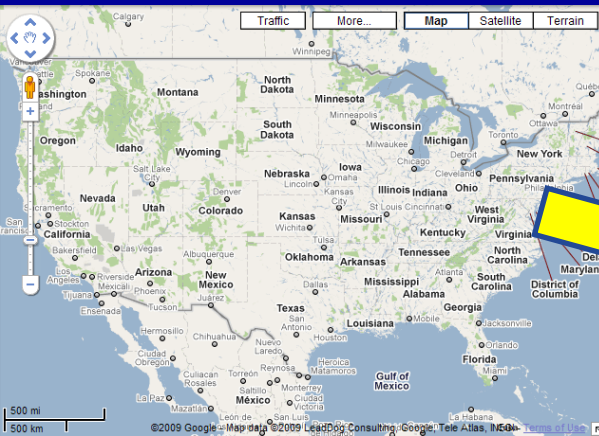
Public Health Action on Climate Change: An Apparent Contradiction

- The health threat is unprecedented
- The health threats are familiar

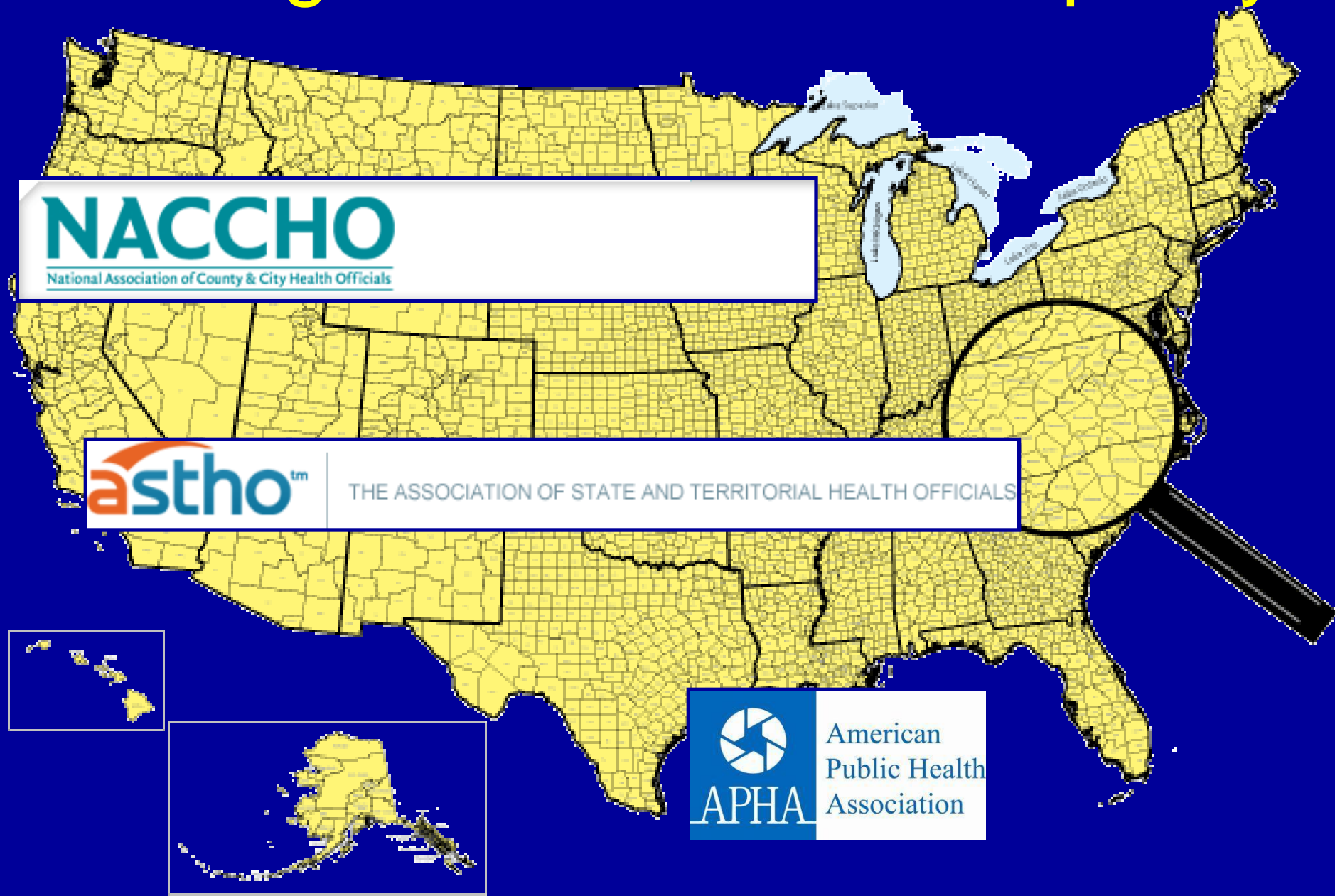


Public Health Action on Climate Change: A Matter of Scale

- Climate change is global
- Effects will manifest locally
- Much public health action must be local



Building State and Local Capacity



Howard Frumkin, MD, DrPH, Jeremy Hess, MD, MPH, George Luber, PhD, Josephine Malilay, PhD, MPH, and Michael McGeehin, PhD, MSPH

weather events cannot be attributed to climate change, the rising burden of storms such as Hurricane Katrina suggests that climate change has already affected public health in the United States. Public health planners and professionals at all levels, policymakers, and the public all need to consider the potential consequences of climate change. Public health accordingly. We propose a framework for public health to address the challenge of climate change.

ians, and public health called for attention to climate practical and ethical overall well-established principles, rigorous, proactive public climate change.

Edited by Kristie L. Ebi, Joel Smith and Ian Burton



Richard Jackson and Kyra Naumoff Shields

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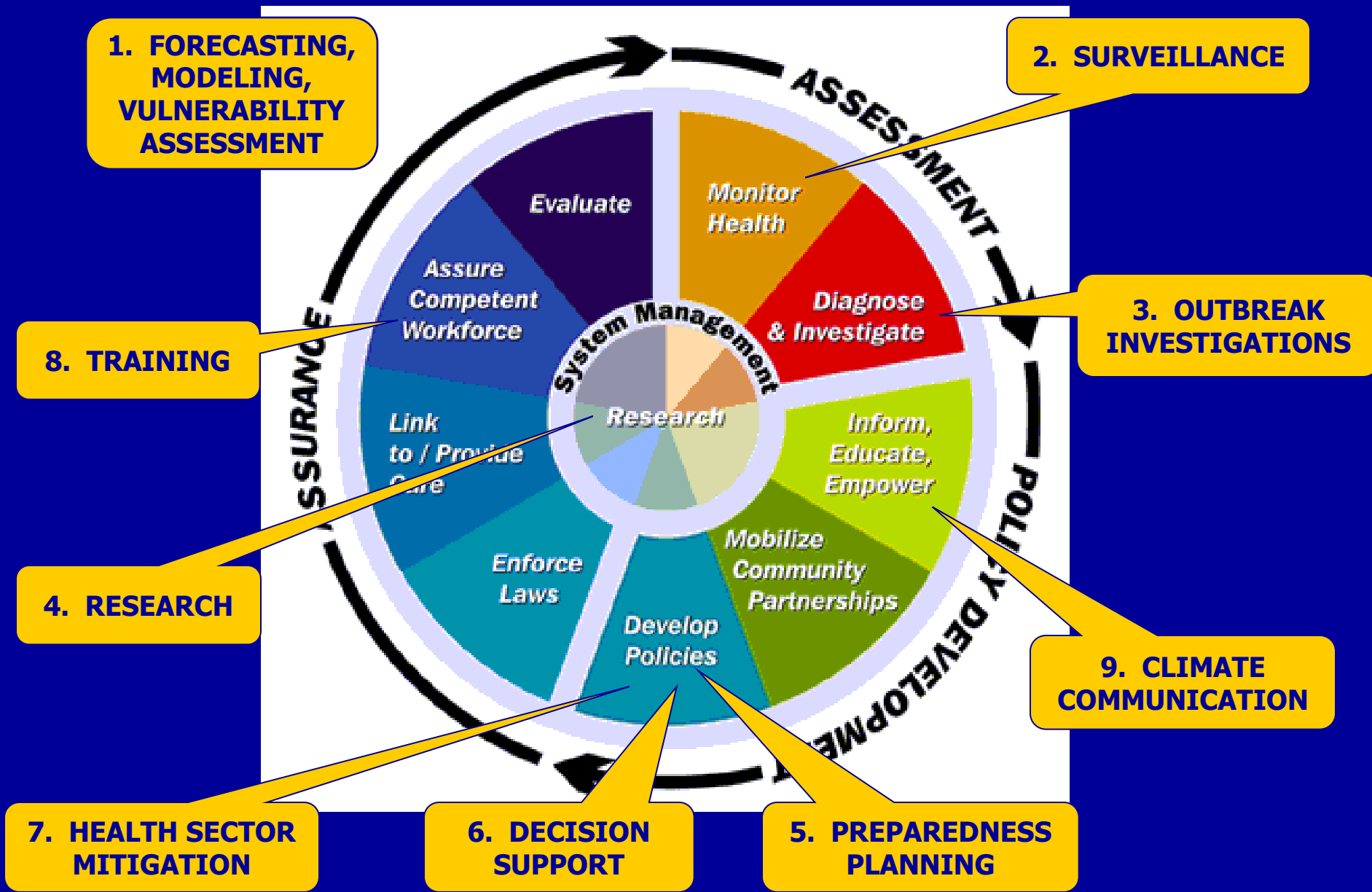
Key Words

physicians, hospitals, cities

Abstract

In society's effort to address and prepare for climate change, the health community itself must ensure that it is prepared. Health personnel will require flexible and iterative action plans to address climate change at the individual, hospital, local health department, state, and national levels. This requires that health workers analyze the impact of climate change with a view to human health, and then formulate robust policy and demonstrate authentic leadership. In this review, we summarize the status of the health community's preparation for climate change and provide specific recommendations for action at each level. Although preparation status and recommendations vary, our observation is that it is not enough for public health and medical care agencies and departments to develop policies and advocate change. They have a direct responsibility to demonstrate substantive leadership.

Public Health Action on Climate Change



1. Forecasting, modeling, vulnerability assessment



- Utilize standard climate models
- Downscale
- Extend to health outcomes
- Focus on vulnerable populations
- Acknowledge and manage uncertainty

2. Surveillance

- Standard public health function
- Multiple data sources
 - Climatologic
 - Ecosystem
 - Health
- Need to integrate data



Notifiable Diseases and Mortality Tables

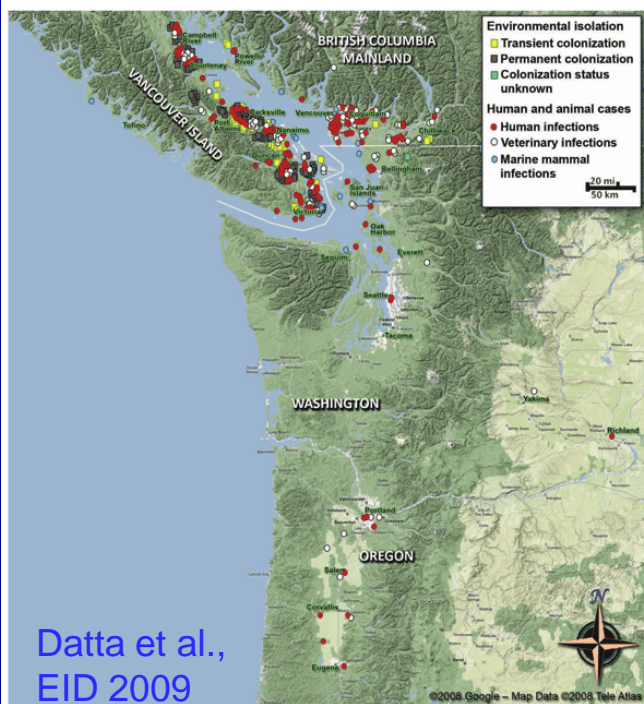
TABLE I. Provisional cases of infrequently reported notifiable diseases (<1,000 cases reported during the preceding year) — United States, week ending January 23, 2010 (3rd week)*

Disease	Current week	Cum 2010	5-year weekly average ^a	Total cases reported for previous years					States reporting cases during current week (No.)
				2009	2008	2007	2006	2005	
Anthrax	—	—	—	—	—	1	1	—	
Botulism, total	—	2	2	99	145	144	165	135	
foodborne	—	—	0	12	17	32	20	19	
infant	—	2	1	64	109	85	97	85	
other (wound and unspecified)	—	—	0	23	19	27	48	31	
Brucellosis	1	1	1	105	80	131	121	120	FL (1)
Chancroid	—	1	1	39	25	23	33	17	
Cholera	—	—	0	8	5	7	9	8	
Cyclosporiasis ^b	1	1	3	126	139	93	137	543	MD (1)
Diphtheria	—	—	—	—	—	—	—	—	
Domestic arboviral diseases ^{c, f}	—	—	—	—	—	—	—	—	
California serogroup virus disease	—	—	—	43	62	55	67	80	
Eastern equine encephalitis virus disease	—	—	—	4	4	4	8	21	
Powassan virus disease	—	—	—	1	2	7	1	1	
St. Louis encephalitis virus disease	—	—	0	10	13	9	10	13	
Western equine encephalitis virus disease	—	—	—	—	—	—	—	—	
Haemophilus influenzae ^g , invasive disease (age <5 yrs):	—	—	—	—	—	—	—	—	
serotype b	—	—	1	26	30	22	29	9	
nonserotype b	—	4	4	213	244	199	175	135	

3. Outbreak investigations



- 1999-2003: 38 cases of *C. gattii* infection on Vancouver Island (Kidd et al. 2004)
- 2003-05: 3 cases in off-island BC, 2 cases in Oregon (MacDougall et al. 2007)
- By 2008: 239 cases in BC, 8 deaths (BCCDC, 2008)



PNAS

Proceedings of the National Academy of Sciences of the United States of America www.pnas.org

PNAS | December 7, 2004 | vol. 101 | no. 49

A rare genotype of *Cryptococcus gattii* caused the cryptococcosis outbreak on Vancouver Island (British Columbia, Canada)

S. E. Kidd^{*,†‡}, F. Hagen[§], R. L. Tschirke[¶], M. Huynh[†], K. H. Bartlett[‡], M. Fyfe[¶], L. MacDougall[¶], T. Boekhout^{§***}, K. J. Kwon-Chung[¶], and W. Meyer^{*,†,‡†}

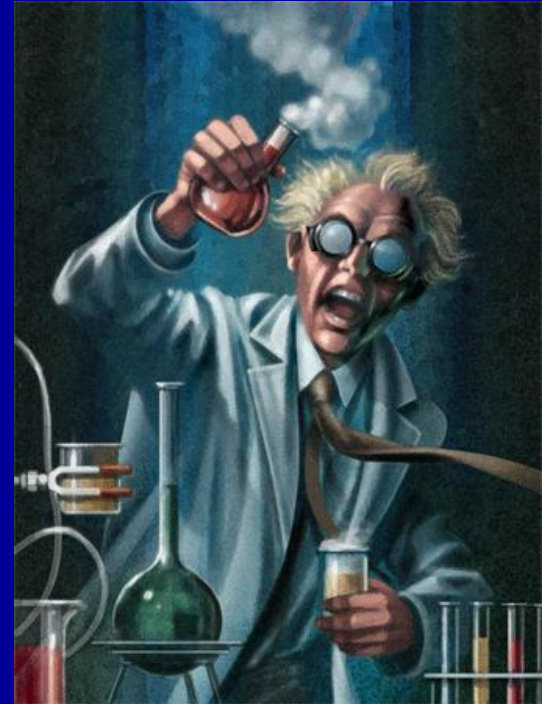
Discussion

Until the recent emergence of cryptococcal infection on Vancouver Island, *C. gattii* had been considered to be restricted to areas with tropical and subtropical climates (2). The identification of large-scale colonization of *C. gattii* in the environment occurring in a temperate climate zone indicates a striking change in the distribution of this species. Furthermore, the identification of the *C. gattii*

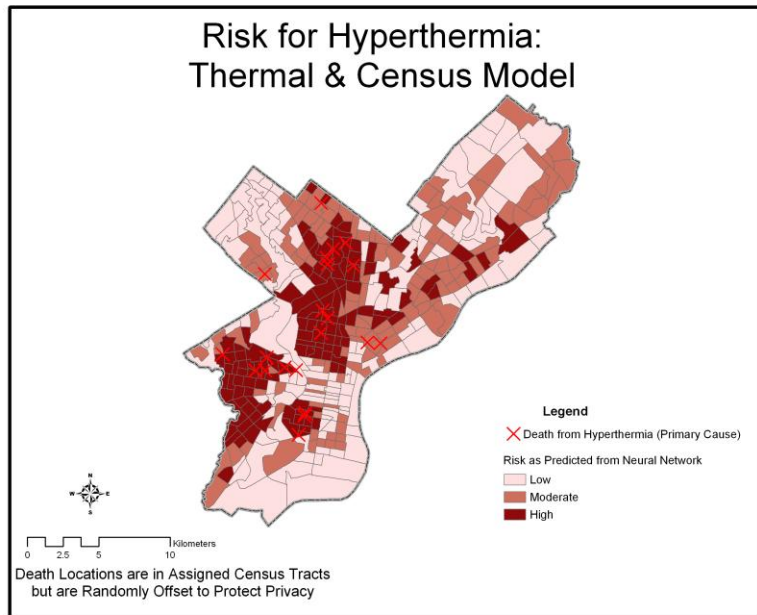
4. Research

Key areas:

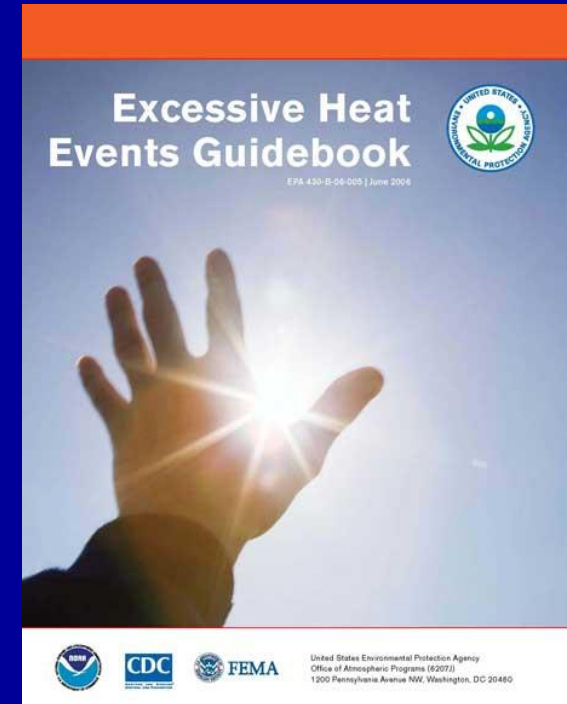
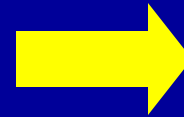
- Methods development
- Impact of climate on specific health outcomes
- Impact of mitigation strategies on specific health outcomes
- Efficacy and cost-effectiveness of various adaptation and mitigation strategies



5. Preparedness planning



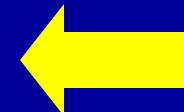
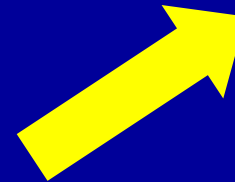
Vulnerability Assessment



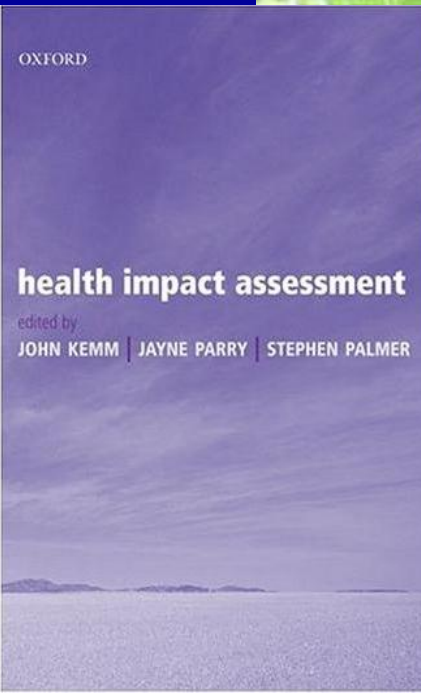
Preparedness


Assessment

Drilling



6. Decision Support: Health Impact Assessment



**World Health Organization**

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☒ All WHO ☐ This site only

Home	Health Impact Assessment (HIA)	QUICK LINKS
About WHO	Evidence Examples Toolkits Other resources	Information package on environmental and occupational health
Countries	WHO > WHO sites	This brochure outlines WHO's strategy to tackle two major energy and health challenges: household energy and indoor air pollution, and transport and health for the developing world. World Health Organization, 2005. Full text
Health topics	Health Impact Assessment	Guidance on evaluating an HIA
Publications		More information
Research tools	HIA provides decision makers with information about how any policy, programme or project may affect the health of people. HIA seeks to influence decision makers to improve the proposal. WHO supports the use of HIA because of its ability to influence policies, programmes and/or projects. This provides a foundation for improved health and wellbeing of people likely to be affected by such proposals	Evidence that HIA works
WHO sites	In this web site, we provide information:	More information
	About HIA	What is a WHO collaborating centre?
	- Why use HIA	More information
	- Short guides	
	- Definitions of HIA	Frequently Asked

7. Health Sector Mitigation: “Green Health Care”



GREEN GUIDE for Health Care™ GGHC

Best Practices for Creating High Performance Healing Environments™

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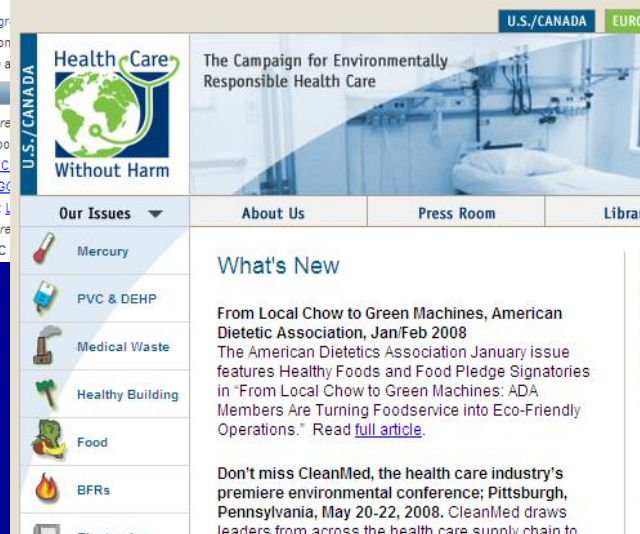
The Green Guide for Health Care is a best practices guide for healthy and sustainable building design, construction, and operations for the healthcare industry. [Learn more](#)

Events | **Download / Forum**

3/14/2008
Webinar - Lessons Learned Webinar,
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Need help going green? Join the discussion and sign up to be a **Press** release: Gre link to access repo [USGBC and GGHC November 2007 G](#) Deadline Dec. 15: [Press release: Gre June 2007 GGHC](#)



Health Care Without Harm

The Campaign for Environmentally Responsible Health Care

U.S./CANADA | EUROPE | GLOBAL SOUTH | Español / English

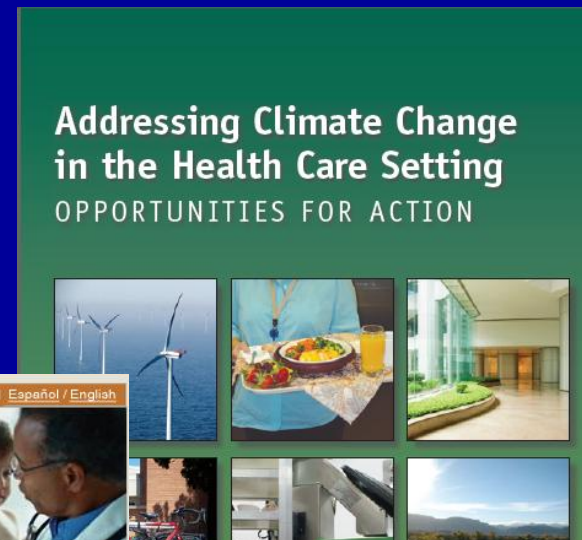
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Mercury
PVC & DEHP
Medical Waste
Healthy Building
Food
BFRs

What's New

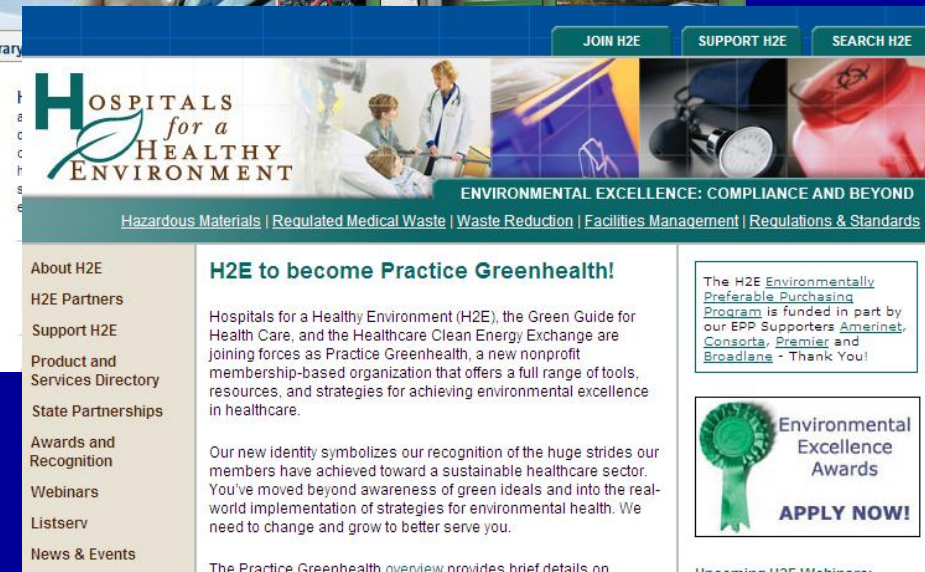
From Local Chow to Green Machines, American Dietetic Association, Jan/Feb 2008
The American Dietetics Association January issue features Healthy Foods and Food Pledge Signatories in "From Local Chow to Green Machines: ADA Members Are Turning Foodservice into Eco-Friendly Operations." Read [full article](#).

Don't miss CleanMed, the health care industry's premiere environmental conference; Pittsburgh, Pennsylvania, May 20-22, 2008. CleanMed draws leaders from across the health care supply chain to



Addressing Climate Change in the Health Care Setting
OPPORTUNITIES FOR ACTION

Images in the grid: Wind turbines, a person eating healthy food, a modern building interior, a person in a lab coat, a person in a lab coat, a person in a lab coat, a person in a lab coat.



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H2E to become Practice Greenhealth!

Hospitals for a Healthy Environment (H2E), the Green Guide for Health Care, and the Healthcare Clean Energy Exchange are joining forces as Practice Greenhealth, a new nonprofit membership-based organization that offers a full range of tools, resources, and strategies for achieving environmental excellence in healthcare.

Our new identity symbolizes our recognition of the huge strides our members have achieved toward a sustainable healthcare sector. You've moved beyond awareness of green ideals and into the real-world implementation of strategies for environmental health. We need to change and grow to better serve you.

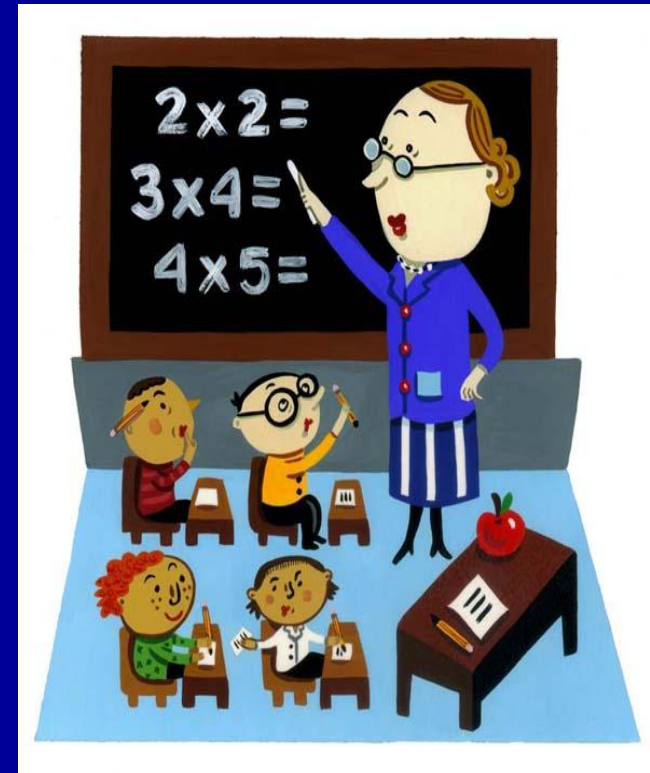
The Practice Greenhealth overview provides brief details on

The H2E Environmentally Preferable Purchasing Program is funded in part by our EPP Supporters [Amerinet](#), [Consortia](#), [Premier](#) and [Broadlane](#) - Thank You!

Environmental Excellence Awards
APPLY NOW!

8. Training and capacity-building

- Need a multidisciplinary workforce
 - Earth and atmospheric sciences
 - Ecology
 - Health sciences
 - Modeling
- Undergraduate, graduate, and postgraduate training



9. Climate communication



Potential Health Effects of Climate Change

Climate change:

- Temperature rise
- Sea level rise
- Hydrologic extremes

HEAT

→ Heat stress, cardiovascular failure

SEVERE WEATHER

→ Injuries, fatalities

AIR POLLUTION

→ Asthma, cardiovascular disease

ALLERGIES

→ Resp allergies, poison ivy

VECTOR-BORNE DISEASES

→ Malaria, dengue, hantavirus, encephalitis, Rift Valley fever

WATER-BORNE DISEASES

→ Cholera, cryptosporidiosis, campylobacter, leptospirosis

WATER AND FOOD SUPPLY

→ Malnutrition, diarrhea, harmful algal blooms

MENTAL HEALTH

→ Anxiety, post-traumatic stress, depression, despair

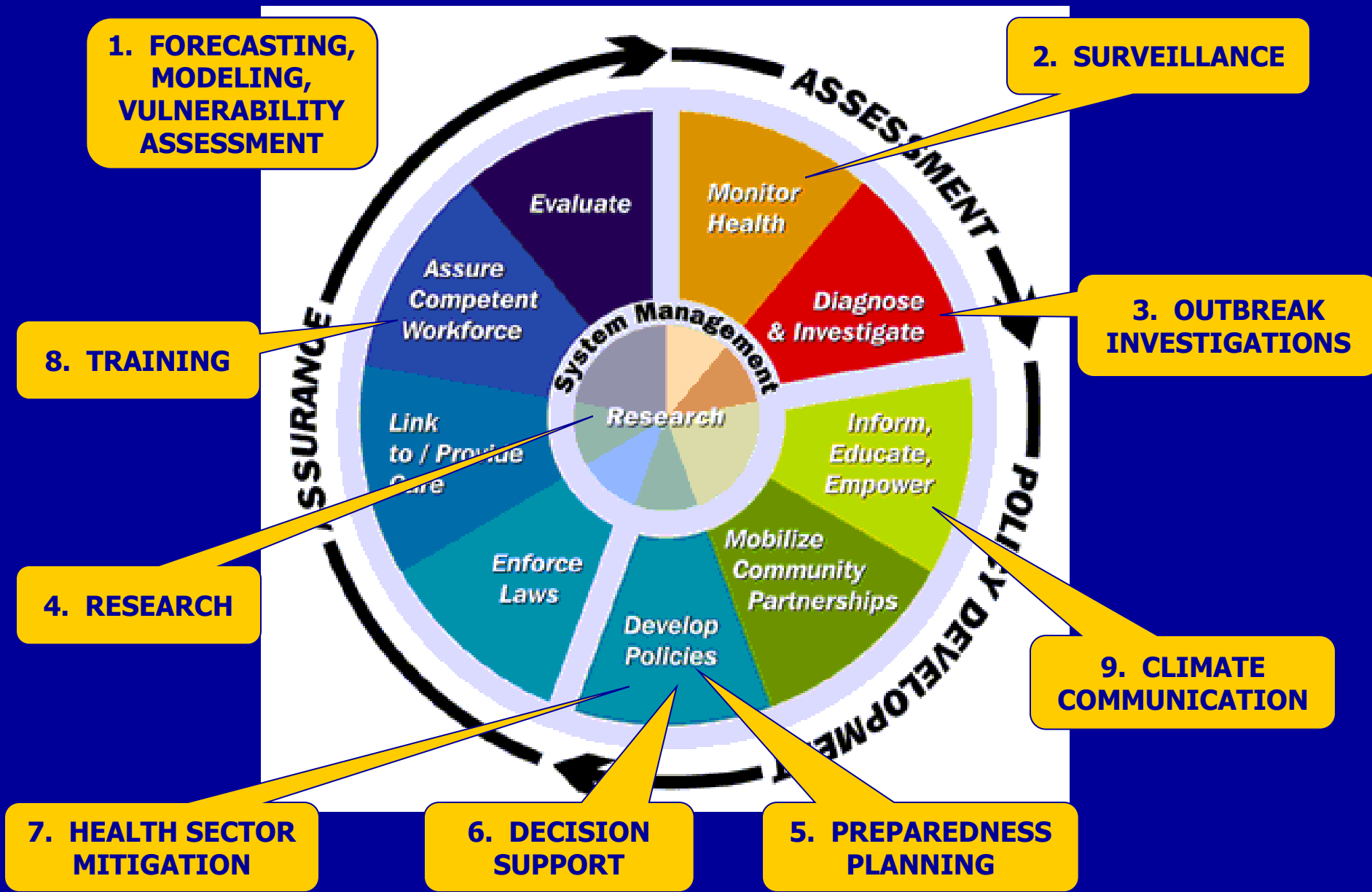
ENVIRONMENTAL REFUGEES

→ Forced migration, civil conflict

Health communication principles

- Recognize different audiences
- Balance threatening news with actionable recommendations
- Appeal to self-interest
- The importance of good news

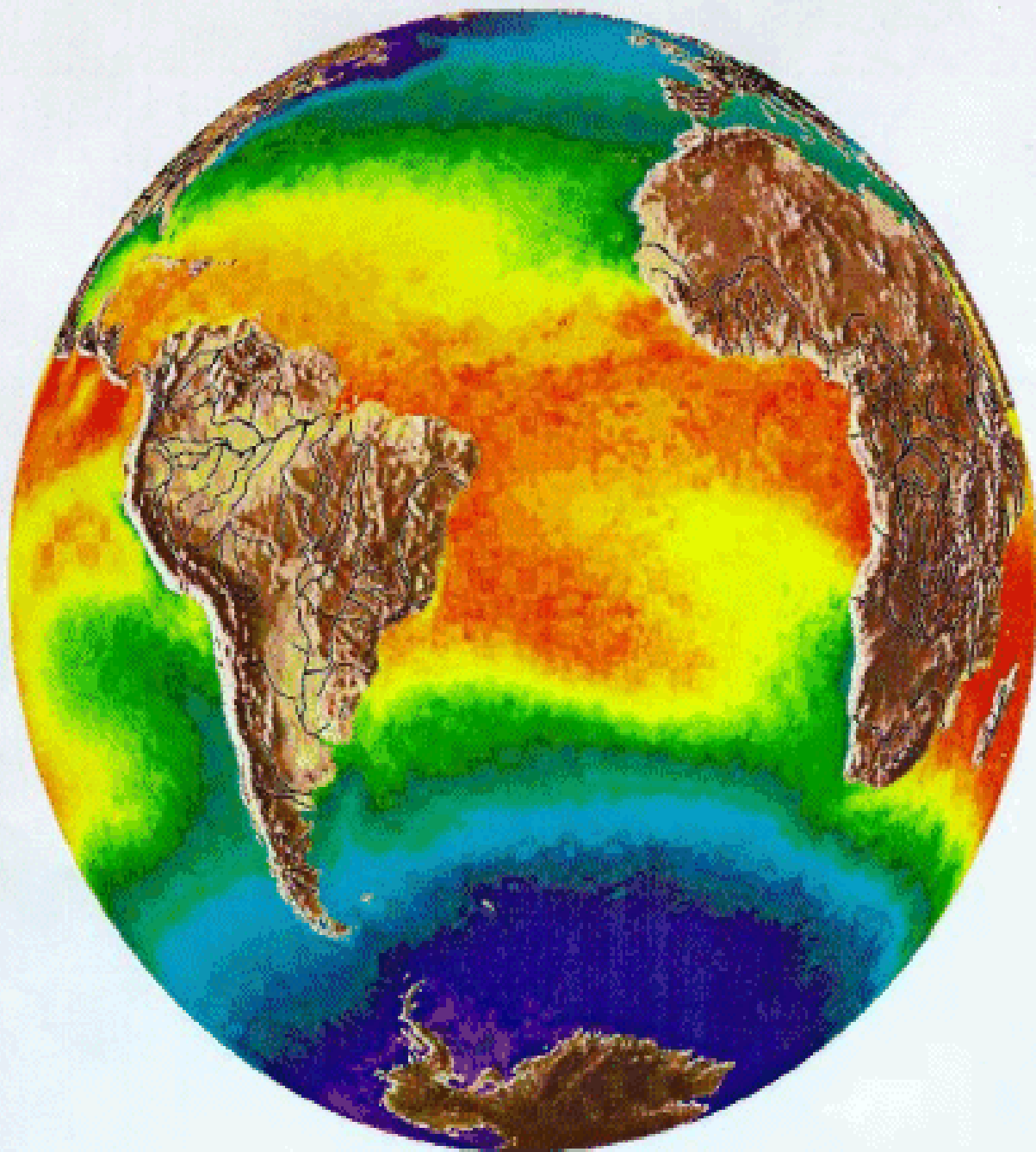
Public Health Action on Climate Change



Summary

- Climate change is a major public health threat
- Adaptation to climate change can protect public health
- Public health adaptation measures are well defined





Thank
you!